

# SUCCESS STORY

## San Juan Water District Sidney N. Peterson Water Treatment Plant

Service Area: **15 square miles**

Water System Capacity: **120 million gallons per day**

Annual Cost of Purchased Energy: **\$401,000 (4,630,000 kilowatthours)**

Annual Savings Attributed to Energy Efficient Strategies: **\$68,400**



**Innovative design and technologies, along with water conservation programs that have cut per capita water use by 26% since 1985, help San Juan Water District save money and avoid construction of new water treatment facilities.**

The San Juan Water District's Sidney N. Peterson Water Treatment Plant provides drinking water for more than 180,000 suburban Sacramento customers. The plant was built to be energy efficient and is operated to encourage energy and water conservation among customers and staff alike. The district even created an incentive program for its employees that rewards them with a percentage of the first year's savings from new cost-cutting techniques that they identify.

A state-of-the-art facility, the Peterson plant uses gravity flow to minimize pumping needs for a 120-mgd modular filtration system. Initial plant designs specified 15 horsepower backwash motors

instead of 100 horsepower units, which reduced construction costs by 33% and lowered filtration energy requirements by 75%. A supervisory control and data acquisition (SCADA) system optimizes day-to-day performance and energy efficiency.

To save more energy and money, district staff implemented these key improvements:

- Replaced eight standard-efficiency motors with [energy-efficient motors](#)
- Installed [variable-frequency drives](#) on flocculation and chemical feed pump motors.
- Replaced incandescent lights with fluorescent units and installed lighting controls
- Launched water conservation education, promotion, and enforcement programs

### ENERGY-EFFICIENT MOTORS

The district uses 18 distribution booster pumps with 40 to 100 horsepower motors that operate from eight to ten hours a day. Staff replaced eight standard motors on these pumps with energy-efficient units.

### Benefits

The new energy-efficient motors have reduced pumping and maintenance costs and increased

equipment life.

## **VARIABLE-FREQUENCY DRIVES**

The agency bought two variable-frequency drives to control the speed of ten 5 horsepower flocculation motors; it also installed two variable-frequency drives to operate six chemical feed pumps (that totaled 20 horsepower). The devices control chemical treatment precisely and save energy when motors operate at slower speeds.

### **Benefits**

The new variable-frequency drives save roughly 30% of flocculation energy costs, and save an undetermined portion of chemical feed pump costs while improving process control.

## **LIGHTING**

Two PG&E energy audits found that [lighting](#) changes could improve energy efficiency. Staff added six photovoltaic sensors to activate 20 outdoor lights, avoiding unnecessary lighting during daylight hours. Indoors, staff converted 30 incandescent lights to fluorescent fixtures, eliminated 30 unnecessary overhead lights, and installed task lighting.

### **Benefits**

These relatively simple lighting upgrades immediately improved employee comfort and safety, while reducing lighting costs by \$2,400 annually.

## **WATER CONSERVATION**

To provide year-round examples of water and energy-efficient agricultural and gardening methods, San Juan established a foundation to develop a 10-acre water-efficient landscape and learning center--the "WEL Garden." Customers can use the agency's water conservation library and request water audits and master gardener services.

The agency invested \$17,000 in rebates for low-flow toilets, \$8,700 for such water-saving tools as low-flow shower heads and toilet tank displacement devices, and has provided \$17,000 in water bill rebates to schools that teach students how to conserve water. These economic incentives are combined with customer prohibitions on such wasteful practices as gutter flooding and use of free-flowing fountains.

### **Benefits**

**"Through successful demand management, the district's per capita water consumption has dropped 26 percent since 1985," says Dee Brookshire, District Administrative Manager.** The reduction has enabled San Juan to serve a larger customer base while postponing the need for expensive capital improvements. "Our long-term goal is to delay the need to build and operate a second treatment plant," she said.

The district's water conservation efforts have resulted in immediate energy savings as well, since water not used is water that does not have to be pumped. San Juan estimates its water savings have effectively reduced its energy costs by over \$50,000 per year.

Energy-Efficiency Improvement	Annual Baseline Energy Cost	Annual Post-Implementation Energy Cost	Annual Estimated Savings
Upgrade 8 booster pumps from standard motors to energy-efficient motors	\$103,000	\$98,000	\$5,000
Install 4 variable-frequency drives to control flocculation motors and chemical feed pumps	\$35,000	\$24,000	\$11,000
Lighting retrofits	\$6,600	\$4,200	\$2,400
Avoided pumping due to water conservation measures*	NA	NA	\$50,000
<b>Estimated Total Annual Savings</b>			<b>\$68,400</b>

\* Savings from retail customers only